PATENT CLAIMS

1. A friction welding machine with a frame (2), with a headstock (5), which has a spindle (8) with a workpiece holder (22) and with a spindle drive (12), and with a feed drive (25) with a second workpiece holder (22), characterized in that said friction welding machine (1) has a second headstock (6) with a spindle (9), with a spindle drive (13) and with said second workpiece holder (22), wherein said second headstock (6) is mounted axially movably at said frame (2) and is connected to said feed drive (25).

2. A friction welding machine in accordance with claim 1, characterized in that said first headstock (5) is arranged stationarily at said frame (2).

3. A friction welding machine in accordance with claim 1 or 2, characterized in that said spindles (8, 9) have different sizes.

4. A friction welding machine in accordance with claim 3, characterized in that said spindle (9) of said second spindle drive (13) is smaller than said other spindle (8).

5. A friction welding machine in accordance with one of the above claims, characterized in that said second spindle drive (13) is weaker than said first spindle drive (12).

6. A friction welding machine in accordance with one of the above claims, characterized in that at least one said workpiece holder (22) has a bridge (10, 11) supporting the forge force and the

torque.

7. A friction welding machine in accordance with one of the above claims, characterized in that a workpiece holder (22) is mounted rigidly at said bridge (10, 11).

8. A friction welding machine in accordance with one of the above claims, characterized in that said bridge (10, 11) has a carrying body (33) and a positive-locking support (34) for connection to at least one said headstock (5, 6).

9. A friction welding machine in accordance with one of the above claims, characterized in that said positive-locking connection (34) has said pins (35) and said openings (36) that engage each other at said carrying body (33) and at said headstock (5, 6).

10. A friction welding machine in accordance with one of the above claims, characterized in that at least one said workpiece holder (22) is detachably connected to a spindle (8, 9).

11. A friction welding machine in accordance with one of the above claims, characterized in that said spindles (8, 9) and said bridge (10, 11) have said similar workpiece holders (22).

12. A friction welding machine in accordance with one of the above claims, characterized in that said second headstock (6) has a traveling carriage (7), which is mounted and guided in a positive-locking manner at a carriage guide (31) at said frame (2) along said direction of feed (32).

13. A friction welding machine in accordance with one of the above claims, characterized in that said feed drive (25) is mounted and supported at a column (4) of said frame (2).

14. A friction welding machine in accordance with one of the above claims, characterized in that said column (4) and said stationary headstock (5) are connected by one or more said tie rods (29).

15. A friction welding machine in accordance with one of the above claims, characterized in that said feed drive (25) has one or more said cylinders (26, 28).

16. A friction welding machine in accordance with one of the above claims, characterized in that said spindle drives (12, 13) have said electric drive motors (14, 15).

17. A friction welding machine in accordance with one of the above claims, characterized in that at least one said spindle drive (12, 13) has said settable flywheel masses (17).

18. A friction welding machine in accordance with one of the above claims, characterized in that said stationary spindle drive (12) has one or more said additional flywheel masses (18) that can be coupled.

19. A process for operating a friction welding machine (1) with a plurality of said headstocks (5, 6) with said spindles (8, 9), said spindle drives (12, 13) and said workpiece mounts (22) as well as with a feed drive (25) for a movably mounted headstock (6), characterized in that a

spindle (8, 9) is relieved of said axial forging and welding forces F and the torque M with a bridge (11) during the welding operation.

20. A process in accordance with claim 19, characterized in that said workpiece mount (22) is removed from said spindle (8, 9) that is to be relieved, and said bridge (11) with a workpiece mount (22) attached thereto is placed over said spindle (8, 9) and connected to said headstock (5, 6) by means of a support (34).